AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings of claims in the application:

LISTING OF CLAIMS:

1. (original) A method for measuring the area of polygonal planar surfaces in space, wherein

- a device (1) is used comprising:

  - a range finder (2) mounted on a leg support (4) by means of a frame (15) having a central point (16) and being suitable for allowing a user to orient the range finder toward a material point of a surface, known as the targeted point, of his choice, said range finder being suitable for being able to deliver a signal representing the distance separating the central point from the targeted point,

  - means (5, 6) for the angular tracking in space of the direction, known as the viewing direction, passing through the central point and the targeted point, these angular tracking means being suitable for being able to deliver signals representing the orientation of the viewing direction relative to a spatial reference frame centred on the central point,

  - the range finder and the angular tracking means thus being suitable for being able to deliver signals representing the spherical coordinates of the targeted point relative to said spatial reference frame,

- means (82) for triggering, at the user's command, the acquisition of the spherical coordinates of the targeted point, which means are capable of triggering the storing of digital data representing the spherical coordinates from the signals delivered by the range finder and the angular tracking means,

- a digital processing unit (9), suitable for being able to model polygonal planar surfaces from the acquired spherical coordinates of targeted points, known as measuring points, which allow said polygonal planar surfaces to be determined topologically,

the method being wherein, for each polygonal planar surface to be measured (13; 55):

- a series of measuring points (19 - 38; 60 - 63) is selected allowing said polygonal planar surface to be determined topologically and individually, which series comprises, for each edge of the polygonal surface, at most two points, the projections of which on said surface in a predetermined direction pertain to said edge,

- said surface is subjected to a modelling process in which the measuring points of the series are plotted by orienting the range finder successively toward each measuring point and by triggering the acquisition of its spherical coordinates, the processing unit being suitable for being able to:

- produce and store a geometric digital model of the polygonal planar surface by generating a segment or a straight line for each edge of said surface from the acquired spherical coordinates of at most two measuring points,

- calculate and record a value representing the surface area of the digital model thus produced.

2. (original) A method as claimed in claim 1, wherein, for at least one polygonal planar surface to be measured (55), a series of measuring points (60 - 63), known as a complete series, is selected which determines on its own the topology of said polygonal planar surface.

3. (original) A method as claimed in claim 2, wherein, for at least one polygonal planar surface (55), a series of measuring points (60 - 63) is selected comprising, for each peak of the polygonal surface, a point, the projection of which on said surface in a predetermined direction coincides with said peak.

4. (original) A method as claimed in claim 3, wherein, for measuring a horizontal polygonal planar surface of a room, such as a horizontal floor or ceiling, a series of measuring points is selected comprising for each peak of the polygonal surface, a point, the vertical projection of which on said horizontal surface coincides with said peak.

5. (original) A method as claimed in claim 2, wherein, for at least one polygonal planar surface (14), a series of measuring points is selected comprising, for each edge (47) of the polygonal surface, two points (45, 46), the projections (48, 49) of which on the surface in a predetermined direction pertain to said edge and are separate.

6. (original) A method as claimed in claim 5, wherein, for measuring a horizontal polygonal planar surface of a room, such as a horizontal floor or ceiling, a series of measuring points is selected comprising, for each edge of the polygonal

surface, two points, the vertical projections of which on said horizontal surface pertain to said edge and are separate.

7. (original) A method as claimed in claim 1, wherein, for at least one polygonal planar surface (13) to be measured:

- on the one hand, a series of measuring points (19 - 38), known as a reduced series, and, on the other hand, a series of geometric constraints to be imposed on a digital model of the polygonal planar surface, including at least one geometric object (29, 32) to be imposed on said digital model and/or at least one geometric relationship to be imposed between geometric objects of said digital model, are selected, said series of measuring points and geometric constraints being selected in such a way that, in combination, they determine the topology of the polygonal planar surface,

- said surface is subjected to a modelling process in which each measuring point (19 - 38) of the corresponding series is plotted and data, known as constraint data, allowing each geometric constraint of the corresponding series to be defined, are input by means of a graphic user interface (12a, 12b),

- the processing unit being suitable for:

  - allowing the user to input such constraint data and to manage said data,

  - producing a digital model of the polygonal planar surface by generating segments and/or straight lines from the acquired spherical coordinates of the reduced series of measuring points and from the input constraint data of the series of constraints.

8. (original) A method as claimed in claim 7, wherein a reduced series of measuring points (19 - 38) is selected comprising, for a plurality of the peaks of the polygonal surface, a point, the projection of which on said surface in a predetermined direction coincides with said peak.

9. (original) A method as claimed in claim 7, wherein a reduced series of measuring points is selected comprising, for a plurality of the edges of the polygonal surface, two points, the projections of which on said surface in a predetermined direction pertain to said edge and are separate.

10. (currently amended) A method as claimed in ~~any one of claims 7 to 9~~ claim 7, wherein at least one item of constraint data is input generating a geometric object selected from a point, a segment and a polygon.

11. (currently amended) A method as claimed in ~~any one of claims 7 to 10~~ claim 7, wherein at least one item of constraint data is input generating a geometric relationship selected from an angle between two segments of the digital model, an orientation of a segment, a length of a segment, a junction between two segments and a parallel arrangement of two segments.

12. (currently amended) A method as claimed in ~~any one of claims 7 to 11~~ claim 7, wherein at least one item of constraint data is input generating a curved geometric object, such as an arc, the processing unit (9) being suitable for producing, from such constraint data, a non-polygonal planar digital model integrating a/some curved geometric object/s and for calculating a value representing the surface area of the digital model thus produced.

13. (currently amended) A method as claimed in ~~any one of claims 1 to 12~~ claim 1, wherein the range finder (2) is manually oriented toward each measuring point.

14. (currently amended) A method as claimed in ~~any one of claims 1 to 13~~ claim 1, wherein the acquisition of the spherical coordinates of each measuring point is manually triggered at the viewing moment of said measuring point.

15. (currently amended) A method as claimed in ~~any one of claims 1 to 14~~ claim 1, wherein the process of modelling a polygonal planar surface (13) includes the following steps:

- measuring points (20 - 24, 34, 35, 37, 38) of the corresponding series, which are visible from a first observation point (A), are plotted,

- the central point of the device is moved to a second observation point (B) from which at least one other measuring point of said series, which is not visible from the first observation point, is visible,

- points (90, 91), known as resetting points, are plotted from the second observation point, said resetting points being selected so as to allow the position of the second observation point to be determined relative to the first observation point,

- the measuring point(s) (25 - 28, 19, 30, 31, 33, 34, 36, 37) which is/are visible from the second observation point is/are plotted, the processing unit being suitable for calculating the coordinates, in the spatial reference frame of

the first observation point, of the second observation point and of the measuring point(s) plotted therefrom.

16. (currently amended) A method as claimed in ~~any one of claims 1 to 15~~ claim 1, wherein the process of modelling each polygonal planar surface includes an initial input of an order to start said process and a final input of an order to terminate said process, with the aid of a user interface of the device.

17. (currently amended) A method as claimed in ~~any one of claims 1 to 16~~ claim 1, wherein a type of series of measuring points is selected and an item of data defining the selected series type is input at the start of the modelling process.

18. (currently amended) A method as claimed in ~~any one of claims 1 to 17~~ claim 1 for measuring a plurality of polygonal planar surfaces (50 - 56) of which it is desired to produce a digital model, known as a consolidated model, encompassing the digital models of said surfaces, wherein an order to start a modelling session is input prior to a first surface modelling process and an order to terminate said session is input after the end of a final surface modelling process.

19. (original) A device for measuring the area of polygonal planar surfaces in space, comprising:

- a range finder (2) mounted on a leg support (4) by means of a frame (15) having a central point (16) and being suitable for allowing a user to orient the range finder toward a material point of a surface, known as the targeted point, of his choice, said range finder being suitable for being able to deliver a signal representing the distance separating the central point from the targeted point,

- means (5, 6) for the angular tracking in space of the direction, known as the viewing direction, passing through the central point and the targeted point, these angular tracking means being suitable for being able to deliver signals representing the orientation of the viewing direction relative to a spatial reference frame centred on the central point,

- the range finder and the angular tracking means thus being suitable for being able to deliver signals representing the spherical coordinates of the targeted point relative to said spatial reference frame,

- means (82) for triggering, at the user's command, the acquisition of the spherical coordinates of the targeted point, which means are capable of triggering the storing of digital data representing these spherical coordinates from the signals delivered by the range finder (2) and the angular tracking means (5, 6),

- a digital processing unit (9), suitable for being able to model polygonal planar surfaces from the acquired spherical coordinates of targeted points, known as measuring points, which allow said polygonal planar surfaces to be determined topologically,

wherein the processing unit is suitable for being able to:

- produce and store a geometric digital model of each polygonal planar surface (13; 55) from a series of measuring points (19 - 38; 60 - 63) which allows said surface to be determined topologically and individually and comprises, for each edge of the polygonal planar surface, at most two points, the projections of which on said surface in a predetermined

direction pertain to said edge, by generating a segment or a straight line for each edge of said surface from the acquired spherical coordinates of at most two measuring points of the series,

- calculate and record a value representing the surface area of each digital model thus produced.

20. (original) A device as claimed in claim 19, wherein the processing unit (9) is suitable for producing a digital model of a polygonal planar surface (55) from the acquired spherical coordinates of a series of measuring points (60 - 63), known as a complete series, which determines on its own the topology of the polygonal planar surface.

21. (original) A device as claimed in claim 20, wherein the processing unit (9) is suitable for producing a digital model of a polygonal planar surface (55) from a series of measuring points comprising, for each peak of the polygonal surface, a point (60 - 63), the projection of which on the surface in a predetermined direction coincides with said peak.

22. (original) A device as claimed in claim 21, intended to be used for measuring the area of surfaces delimiting a room, wherein the processing unit (9) is suitable for producing a digital model of a horizontal polygonal planar surface, such as a horizontal floor or ceiling, from a series of measuring points comprising, for each peak of the polygonal surface, a point, the vertical projection of which on said horizontal surface coincides with said peak.

23. (original) A device as claimed in claim 20, wherein the processing unit (9) is suitable for producing a digital model of a polygonal planar surface (14; 54) from a series of

measuring points comprising, for each edge of the polygonal surface, two points (45, 46 ...; 65, 66, 68 - 73), the projections of which on the surface in a predetermined direction pertain to said edge and are separate.

24. (original) A device as claimed in claim 23, intended to be used for measuring the area of surfaces delimiting a room, wherein the processing unit (9) is suitable for producing a digital model of a horizontal polygonal planar surface (14), such as a horizontal floor or ceiling, from a series of measuring points comprising, for each edge (47) of the polygonal surface, two points (45, 46), the vertical projections (48, 49) of which on said horizontal surface pertain to said edge and are separate.

25. (currently amended) A device as claimed in ~~any one of claims 19 to 24~~ claim 19, wherein the processing unit (9) is suitable for:

- allowing the user, by means of a graphic user interface (12a, 12b), to input data, known as constraint data, allowing definition of geometric constraints to be imposed on a digital model, including data allowing generation of geometric objects in the digital model and data allowing generation of geometric relationships between geometric objects of the digital model,

- managing input constraint data so as to allow the production of a digital model of a polygonal planar surface (13) by generating segments and/or straight lines from the acquired spherical coordinates of a series of measuring points (19 - 38), known as a reduced series, and from the input constraint data of a series of geometric constraints, said series of measuring points and constraints allowing, in

combination, the topology of the polygonal planar surface to be determined.

26. (original) A device as claimed in claim 25, wherein the processing unit (9) is suitable for allowing the user to input constraint data generating geometric objects selected from a point, a segment and a polygon.

27. (currently amended) A device as claimed in ~~either claim 25 or claim 26~~ claim 25, wherein the processing unit (9) is suitable for allowing the user to input constraint data generating geometric relationships selected from an angle between two segments of the digital model, an orientation of a segment, a length of a segment, a junction between two segments and a parallel arrangement of two segments.

28. (currently amended) A device as claimed in ~~claims 25 to 27~~ claim 25, wherein the processing unit (9) is suitable for:

- allowing the user to input constraint data generating curved geometric objects, such as an arc,

- producing, from such constraint data, a non-polygonal planar digital model integrating a/some curved geometric object/s,

- calculating a value representing the surface area of the digital model thus produced.

29. (currently amended) A device as claimed in ~~claims 25 to 28~~ claim 25, wherein the processing unit (9) is suitable for managing non-oriented constraints, using a variational approach.

30. (currently amended) A device as claimed in ~~any one of claims 19 to 29~~ claim 19, wherein the processing unit (9) is suitable for producing two-dimensional geometric digital models.

31. (currently amended) A device as claimed in ~~any one of claims 19 to 30~~ claim 19, wherein the processing unit (9) is suitable for producing three-dimensional geometric digital models.

32. (currently amended) A device as claimed in ~~claims 19 to 31~~ claim 19, wherein the processing unit (9) is suitable for producing a model, known as a consolidated model, encompassing a plurality of digital models, each corresponding to a polygonal planar surface.

33. (currently amended) A device as claimed in ~~any one of claims 19 to 32~~ claim 19, wherein the processing unit (9) is suitable for calculating and recording a value representing the length of each segment of a digital model produced and a value representing the length of the perimeter of the digital model.

34. (currently amended) A device as claimed in ~~any one of claims 19 to 33~~ claim 19, wherein the frame (15) comprises means (7, 8) for manoeuvring the range finder, which means are suitable for allowing said range finder to be manually oriented by the user.

35. (currently amended) A device as claimed in ~~any one of claims 19 to 34~~ claim 19, wherein the triggering means comprise a manual triggering member (82) having immediate effect.

36. (currently amended) A device as claimed in ~~any one of claims 19 to 35~~ claim 19, wherein the angular tracking means comprise two angle encoders (5, 6).